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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,700	01/18/2002	Wei Ping Zheng	967AF	7390

7590
Kevin Redmond
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Palm City, FL 34990

09/05/2003

EXAMINER

GLENN, KIMBERLY E

ART UNIT PAPER NUMBER

2817

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/050,700

Applicant(s)

ZHENG ET AL.

Examiner

Kimberly E Glenn

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 15-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-12 and 15-28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

The drawings were received on 5/19/03. These drawings are acceptable.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanigawa et al. JP 62-147808 in view of Branchevsky US Patent 6,252,761 and Rosenberg US Patent 4,516,092. (All of record)

The Tanigawa et al. reference discloses in figure 1 a power splitter comprising: a resistor 5; a capacitor 4; a binocular core transformer 11 (figure 3) with windings 1, 2, and 6 that provide power dividing and impedance matching (suggested by Z_i , Z_o , Z_o in figure 1).

However, the reference does not show the claimed structure, which includes a substrate with vias having the capacitor in the layers and the resistor on the layer.

Nevertheless, The Branchevsky reference teaches that circuits are advantageously formed using LTCC (low-temperature co-fired ceramic) substrates with capacitors built in the substrate (with screened electrodes on different layers) using vias (punched and filled with a conductive material) for connections and circuits printed on the layers that are then stacked, pressed, and fired in an oven. LTCC allows for smaller sized circuits than using a standard circuit board. (See col. 1, lines 12-50) Components (such as resistor) that are too large or too difficult to form within the layer are mounted on the substrate (See col. 1, lines 32-35)

The Rosenberg reference teaches in figure 2 that a bulky inductor device is mounted on the surface of a capacitor by adhesives (col. 2, lines 55-60) with the leads attached to the terminals on the upper surface (col. 2, lines 62-63).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the power splitter of Tanigawa et al. on a LTCC substrate with the capacitor built-in using vias to make connections and the bulky transformers taught by both of the Branchevsky and Rosenberg references (with the method suggested by Branchevsky and

Rosenberg) because such a modification would have advantageously formed a reduced-sized splitter as suggested by Branchevsky and Rosenberg.

With respect to impedance matching as recited in claim 1, such a modification would have been obvious even if the Tanigawa et al. reference does not explicitly state it because such impedance matching is required for proper operation (i.e. no reflections). Also, with respect to forming the resistor on the top layer (e.g. claim 12), such a modification would have been obvious because it would have advantageously allowed trimming of the resistor as would have been well known.

With respect to attaching the transformer using epoxy (e.g. claims 4, 16), such a modification would have been obvious because as the references are silent as to the type of adhesive used, any art-recognized equivalent adhesive would have been usable such as epoxy.

With respect to using welds to attach the leads (e.g. claim 6, 17, 25), the Rosenberg reference suggests using solder or other means (col. 2, lines 62-63). Welds are well-known art recognized equivalent means for making electrical connections and use thereof would have been considered a mere substitution of art-recognized equivalent electrical attachment means.

With respect to attaching the device to a circuit board by reflow solder, it should be noted that such practice is conventional for attaching circuits to a circuit board in mass production; therefore, such a modification would have been obvious because it would have allowed for connection to other devices on a circuit board in mass production.

With respect to cascaded power splitters (claims 9-11 and 20-22), such cascading is well known in order to form multiple outputs as is desired based on the required use. Therefore, such a modification would have been obvious.

Response to Arguments

Applicant's arguments filed 5/19/03 have been fully considered but they are not persuasive. Applicant argues that neither the Branchevsky nor the Rosenberg reference teach having a resistor on the top surface of the substrate. Branchevsky '761 states in column 1, lines 32-35 that components that are too large or too difficult to form within the ceramic tape layers, such as silicon chips, may be mounted on the hardened substrate. Branchevsky also states in US Patent 6,470,545 titled " Method of making an embedded green multi-layered ceramic chip capacitor in a low temperature co-fired ceramic (LTCC) substrate" that silicon capacitors, resistors, inductors and chip may be mounted on the hardened substrate. Therefore, Branchevsky does teach mounting a resistor on the surface of the substrate.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Chen et al US Patent discloses a splitter comprising a transformer mounted on a substrate. (See figure 5)
- Branchevsky US Patent 6,470,545 discloses a LTCC substrate wherein some components are mount on the surface of the substrate. (Col. 1 lines 38-41)

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

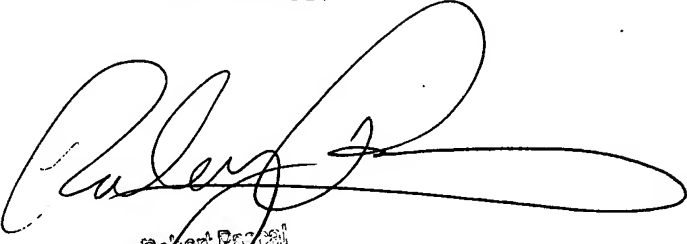
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (703) 306-5942. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Kimberly E Glenn
Examiner
Art Unit 2817

keg



Robert Pascal
Supervisor, Patent Examination
Telephone: 308-4909